

## WHAT IS CLAIMED IS:

- 1 1. A syringe comprising:  
2 a chamber for receiving a plunger of an actuator, the plunger being  
3 movable axially with respect to the chamber when the actuator is operated;  
4 a connector to be fixed relative to the chamber and to facilitate  
5 entry of the plunger into the chamber, and  
6 a viscoselective high pressure seal associated with the plunger.
- 1 2. The syringe of claim 1, wherein the connector includes an advancement  
2 mechanism movable between first and second positions to engage with and  
3 disengage from the actuator for providing for both incremental advancement  
4 of the plunger in the chamber, and free axial movement thereof, respectively.
- 1 3. The syringe of claim 1, wherein a distal tip portion of the plunger  
2 comprises a seal member therearound so sized for its radially outwardly  
3 directed surface to assuredly sealingly engage an inside surface of the  
4 chamber during an application procedure but be movable therealong during  
5 actuation of the plunger.
- 1 4. The syringe of claim 3, wherein at least one relatively small aperture  
2 extends longitudinally within the plunger tip portion from distally of the seal  
3 member to proximally thereof, passing under the seal member, the aperture  
4 being sufficiently small to effectively inhibit passage of viscous material  
5 therealong and define an air escape vent.
- 1 5. The syringe of claim 3, wherein the seal member is an O-ring of material  
2 having a limited resilience.

- 1 6. The syringe of claim 3, wherein the seal member includes air escape  
2 vents extending therethrough or therealong.
- 1 7. The syringe of claim 6, wherein the seal member air escape vents close  
2 under compression of the seal member to prevent viscous material to pass  
3 therealong.
- 1 8. The syringe of claim 3, wherein the plunger distal tip portion comprises  
2 a circumferential seal seat just proximally of a distal end thereof in which is  
3 disposed the seal member.
- 1 9. The syringe of claim 8, wherein the seal seat has a geometry that  
2 provides for escape of air between the seal member and the seat bottom  
3 surface.
- 1 10. The syringe of claim 8, wherein the seal seat permits slight axial  
2 movement of the seal member within the seal seat.
- 1 11. The syringe of claim 8, wherein small vents extend longitudinally from  
2 distally of the seal member to proximally thereof prior to the seal member  
3 being urged to a most proximal position by viscous material during actuation  
4 of the plunger.
- 1 12. The syringe of claim 8, wherein the seal seat is knurled to provide a  
2 pattern of grooves defining air escape vents.
- 1 13. The syringe of claim 8, wherein ribs extends axially within the seal seat  
2 that are engaged by the seal member's inwardly directed surface, such that  
3 gaps between the ribs define air escape vents.

092532-060601

1 14. A syringe comprising:

2 a chamber extending to a distal tip portion and having a proximal  
3 end adapted to receive thereinto an actuator that is movable axially with  
4 respect to the chamber;

5 an actuator having a plunger extending to a distal tip portion  
6 associated with the chamber distal tip portion, and further having an  
7 actuation section at a proximal end of the plunger; wherein the distal tip  
8 portion of the plunger is adapted to define a viscoselective high pressure seal  
9 with respect to the chamber distal tip portion; and

10 a connector affixable to the chamber for enabling connection of  
11 the actuator to the chamber, wherein the connector includes an  
12 advancement mechanism adapted to be moved between first and second  
13 positions to engage with and disengage from the actuator for providing for  
14 both incremental advancement of the plunger in the chamber, and free axial  
15 movement thereof, respectively.

1 15. The syringe of claim 14, wherein the advancement mechanism has  
2 threaded surfaces to cooperate with corresponding threaded surfaces on the  
3 plunger when engaged, so that the plunger is constrained to move  
4 longitudinally only incrementally with respect to the connector and the  
5 chamber as the actuation section is rotated.

1 16. The syringe of claim 15, wherein the connector is rotatable between  
2 first and second positions and the threaded surfaces are defined on  
3 deflectable sections where, in the first position, the threaded sections have  
4 been deflected radially inwardly by a cam of the connector to engage the  
5 plunger threads, and where, in the second position, the threaded sections  
6 have disengaged from the cam and resile radially outwardly to be disengaged  
7 from the plunger allowing the plunger to be movable freely longitudinally.

09875532 060601

1 17. A syringe comprising:

2 a chamber extending to a distal tip portion and having a proximal  
3 end adapted to receive thereinto an actuator that is movable axially with  
4 respect to the chamber;

5 an actuator having a plunger extending to a distal tip portion  
6 associated with the chamber distal tip portion, and further having an  
7 actuation section at a proximal end of the plunger, wherein the distal tip  
8 portion of the plunger is adapted to define a viscoselective high pressure seal  
9 with respect to the chamber distal dip portion; and

10 a connector affixable to the chamber for enabling connection of  
11 the actuator to the chamber,

12 wherein the plunger distal tip portion comprises a seal member  
13 therearound so sized for its radially outwardly directed surface to assuredly  
14 sealingly engage an inside surface of the chamber during an application  
15 procedure but be movable therealong during actuation of the plunger, and

16 wherein at least one very small aperture extends longitudinally  
17 within the plunger tip portion from distally of the seal member to proximally  
18 thereof, passing under the seal member, the aperture being sufficiently small  
19 to effectively inhibit.

1 18. A syringe comprising:

2 a chamber extending to a distal tip portion and having a proximal  
3 end adapted to receive thereinto an actuator that is movable axially with  
4 respect to the chamber;

5 an actuator having a plunger extending to a distal tip portion  
6 associated with the chamber distal tip portion, and further having an  
7 actuation section at a proximal end of the plunger, wherein the distal tip  
8 portion of the plunger is adapted to define a viscoselective high pressure seal  
9 with respect to the chamber distal dip portion; and

1 19. A syringe comprising:

5            an actuator having a plunger extending to a distal tip portion  
6    associated with the chamber distal tip portion, and further having an  
7    actuation section at a proximal end of the plunger, wherein the distal tip  
8    portion of the plunger is adapted to define a viscoselective high pressure seal  
9    with respect to the chamber distal dip portion; and

12                wherein the plunger distal tip portion comprises a seal member  
13        therearound so sized for its radially outwardly directed surface to assuredly  
14        sealingly engage an inside surface of the chamber during an application  
15        procedure but be movable therealong during actuation of the plunger,

19 wherein the seal seat has a geometry that provides for escape of  
20 air between the seal member and the seat bottom surface.

20. A syringe comprising:

- a chamber extending to a distal tip portion and having a proximal end adapted to receive therein an actuator that is movable axially with respect to the chamber;
- an actuator having a plunger extending to a distal tip portion associated with the chamber distal tip portion, and further having an actuation section at a proximal end of the plunger, wherein the distal tip portion of the plunger is adapted to define a viscoselective high pressure seal with respect to the chamber distal tip portion; and
- a connector affixable to the chamber for enabling connection of the actuator to the chamber,

wherein the plunger distal tip portion comprises a seal member therearound so sized for its radially outwardly directed surface to assuredly sealingly engage an inside surface of the chamber during an application procedure but be movable therealong during actuation of the plunger,

wherein the plunger distal tip portion comprises a circumferential seal seat just proximally of a distal end thereof in which is disposed the seal member, and

wherein the seal seat permits slight axial movement of the seal member within the seal seat and wherein small vents extend longitudinally from distally of the seal member to proximally thereof prior to the seal member being urged to a most proximal position by viscous material during actuation of the plunger.